

**ABPL:**

An insulation system for the windings of a dynamoelectric machine is described wherein a bundle of insulated conductors is provided with layers of groundwall insulation. The innermost layer of groundwall insulation has superior corona discharge resistant properties. A second layer of groundwall insulation which has a corona discharge resistance somewhat less than the innermost layer of groundwall is superimposed on the innermost layer.

**BSPR:**

This application relates to a method of insulating electrical coils of a dynamoelectric machine using insulation layers of insulating tape having differing insulating characteristics and qualities and more particularly layers having differing corona withstand capabilities. The cost of the layers of insulation applied to the coils or half coils of dynamoelectric machines varies in accordance with the cost of production of each variety of insulation, and as expected, the insulating medium which offers the most attractive capabilities from an insulation point of view is generally the costliest. At the present time, most manufacturers who are attempting to provide an effective insulating layer on large AC dynamoelectric machine winding elements would probably defer to a composite corona resistant polyimide insulation which is loaded with a corona resistant material, such as for instance, finely divided aluminum oxide,

**United States Patent** [19]  
**Draper et al.**

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**[54] MULTI-LAYER INSULATION FOR WINDING ELEMENTS OF DYNAMOELECTRIC MACHINES (D.E.M.S)**
**[75] Inventors:** Robert Edward Draper, Peterborough;  
 Luc Jean Joseph Lafortune, Laval;  
 Michael Boudry, Beloeil; Bernard  
 John Moore, Peterborough, all of  
 Canada

**[73] Assignee:** General Electric Canada Inc.,  
 Mississauga, Canada

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**[51] Int. Cl.:** H01B 7/34

**[52] U.S. Cl.:** 174/120 R; 174/124 R; 310/45; 310/46

**[58] Field of Search:** 174/120 R, 120 C, 174/220 SR, 122 R, 124 R; 310/45, 45
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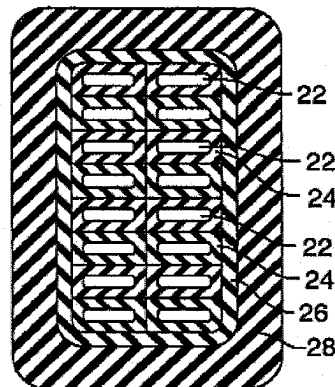
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**Primary Examiner**—Bot L. Ledynh  
**Assistant Examiner**—Chau N. Nguyen  
**Attorney, Agent, or Firm**—E. Oldham
**[57] ABSTRACT**

An insulation system for the windings of a dynamoelectric machine is described wherein a bundle of insulated conductors is provided with layers of groundwall insulation. The innermost layer of groundwall insulation has superior corona discharge resistant properties. A second layer of groundwall insulation which has a corona discharge resistance somewhat less than the innermost layer of groundwall is superimposed on the innermost layer.

3 Claims, 3 Drawing Sheets

**20**

conductivity of the ridges 20 to be in a range of one to ten thousand ohms per square. Those familiar with the manufacture of high voltage dynamoelectric machines will understand that such semi-conductive materials are suitable for the intended purpose of the invention if they are adequately conductive to prevent the formation of corona across any voids that may exist between the sides of coil winding 2 and the sides of coil-receiving slots 4, while being sufficiently high in resistance to prevent appreciable loss due to eddy current flowing between the respective ends of the core stack laminations 3.

#### DEPR:

In the combined assembly of the present invention, each of the mats (19) is positioned, respectively, one in each of the coil-receiving slots 4 with the rubber-coated, ridged (20) side of each such mat being compressed against the side of a core slot by the coil side (8) mounted therein. Such an arrangement results in the ridges 20 being deformed as best seen in FIG. 3 so that any pre-existing voids caused by the irregularities between the laminations 3 and the irregularities (15 and 16) of the coil sides 8 are completely or at least substantially filled by the semi-conductive rubber 20 and the pressure-deformed mat 19. Thus, the resultant structure forms a good heat transmitting path between the respective sides of the coils and the core stack 1, while also

## United States Patent [19]

Rhudy et al.

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[45] Feb. 15, 1977

### [54] DYNAMOELECTRIC MACHINE CORE AND COIL ASSEMBLY

[75] Inventors: Ralph G. Rhudy; Hans R. Casanova, both of Scotia, N.Y.

[73] Assignee: General Electric Company, Schenectady, N.Y.

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174/127; 336/84

[51] Int. Cl.: H02K 13/12

[58] Field of Search: 310/179, 180, 45, 184,

310/260, 187, 270, 189, 196, 194, 214, 215;

427/127; 428/244, 266, 268; 336/84 C, 205,

84; 174/117, 117 FF, 117 F, 120, 110, 113,

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Primary Examiner—R. Skully

Attorney, Agent, or Firm—Vale P. Myles

[57] ABSTRACT

A dynamoelectric machine core and coil assembly characterized by having a separately insertable conformable side filler, such as resin impregnated fiber glass provided with a plurality of ridges of an electrically semi-conductive, pressure-deformable elastomer bonded to one side thereof. In the assembly the conformable side filler is compressed between the side of a coil-receiving laminated core slot and the relatively smooth sides of coil windings mounted in the slot. As thus compressed, the side filler forms a good thermally conductive path between the somewhat irregular coil sides and the core to thereby prevent undesirable temperature rises. The side fillers also prevent insulation-detracting vibration of the coils in the slots, and due to the semi-conductive nature of the side fillers, they prevent the formation of coronas across any voids that might exist between the sides of the coil insulation and the sides of the coil-receiving slots.

7 Claims, 3 Drawing Figures

